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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,682	10/11/2001	Gang Huang	117.0015	9461
47549	7590	02/15/2006	EXAMINER	
PRIEST & GOLDSTEIN, PLLC 5015 SOUTHPARK DRIVE SUITE 230 DURHAM, NC 27713			KIM, KEVIN	
			ART UNIT	PAPER NUMBER
			2638	

DATE MAILED: 02/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/975,682	<b>Applicant(s)</b> HUANG, GANG	
	<b>Examiner</b> Kevin Y. Kim	<b>Art Unit</b> 2638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-18 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 9, 11-17 and 23 is/are rejected.
- 7) ☒ Claim(s) 7 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3,6, 8, 9, 11• are rejected under 35 U.S.C. 102(e) as being anticipated by Nordstrom et al (US 2001/0004383).

Claims 1 and 23.

Nordstrom et al discloses a method and apparatus for reducing cross-talk in a communications system comprising a plurality of transmitters for transmitting encoded data signals via respective communications channels (see Abstract), said method comprising:

processing encoded data signals from the plurality of transmitters utilizing at least one pre-coding matrix to produce a first pre-coded signal (see Fig.3, paragraph [0033]) ,

communicating said first pre-coded signal to a respective first communication channel and

adapting said at least one pre-coding matrix in response to an impairment indicative signal (see paragraph [0037]);

said processing tending to offset channel impairments within said first communications channel.

Claim 2.

Nordstrom et al discloses receiving said first pre-coded signal from said first communications channel; and generating said impairment indicative signal in response to a determination of a channel impairment level of said first communications channel. See paragraph [0036].

Claim 3.

Nordstrom et al discloses a least mean square (LMS) algorithm. See paragraph [0036].

Claim 6.

Nordstrom et al further discloses selecting, as initial parameters of said pre-coding matrix, a set of parameters tending to offset said channel impairment of said first communications channel, said step of selecting initial parameters comprising the steps of:

- propagating a pre-defined training sequence via said first communications channel;
- receiving said pre-defined training sequence from said first communications channel;
- and
- determining, using said received pre-defined training sequence, a channel impairment of said first communications channel. See paragraph [0052].

Claim 8.

Nordstrom et al disclose N transmitters (20), where N is an integer. See Fig.2.

Claim 9.

Nordstrom et al discloses that each of said N transmitters processes an encoded data signal utilizing a pre-coding matrix, each pre-coding matrix processing encoded data signals from the other transmitters. See Fig.2.

Claim 11.

Nordstrom et al further discloses that each of the N transmitters performs the step of selecting, as initial parameters for its respective pre-coding matrix prior to processing a respective encoded data signal, said selected initial parameters tending to offset channel impairments of the respective communication channels, said step of selecting initial parameters comprising the steps of:

propagating a pre-defined training sequence via a respective communications channel;  
receiving said pre-defined training sequence from said respective communications channel; and

determining initial parameters for said pre-coding matrix using said received pre-defined training sequence, to adapt to said channel impairment of said respective communications channel. See paragraph [0052].

***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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4. Claims 4, 5, 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nordstrom, as applied to claim 1 above, in view of Timm et al. (US 6,055,268 previously cited).

Claims 4, 5, 14, 16 and 17.

Nordstrom discloses all the subject matter claimed but does not particularly teach a CAP signal or QAM signal. However, it is well known in the art that a DSL system may use a CAP signal or QAM signal. Timm teach a DSL system may use DMT, QAM or Cap signals (col. 3, lines 61-62 and 66-67). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a CAP signal or a QAM signal in the DSL system of Nordstrom since the use of a CAP signal or a QAM signal in a DSL system involves only routine skill in the art.

Additionally with respect to claim 14, since QAM is used the communication channel propagates a respective set of in-phase and quadrature signals.

Claim 15.

Nordstrom et al discloses a least mean square (LMS) algorithm. See paragraph [0036].

5. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nordstrom, as applied to claims 6 and 11 above, in view of Schneider et al (US 6,314,135 previously cited).

Nordstrom discloses all the subject matter claimed for training an equalizer to reduce channel-specific impairments from the training sequence prior to selecting the initial matrix parameters.

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Schneider et al teaches an equalizer to compensate channel impairments using a training sequence. See Fig.4 and related descriptions. Thus, it would have been obvious to one skilled in the art at the time the invention was made to provide an equalizer and training it to compensate channel impairments in the communication system of Nordstrom, as taught by Schneider et al.

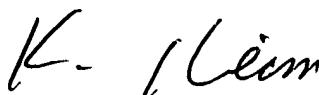
***Allowable Subject Matter***

6. Claims 7 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**KEVIN KIM  
PATENT EXAMINER**